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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,780	11/12/2003	Christian Grewing	P2001,0334	8047

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EXAMINER	
JACKSON, BLANE J	
ART UNIT	PAPER NUMBER
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/706,780	GREWING ET AL.	
	Examiner	Art Unit	
	Blane J. Jackson	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement filed 18 December 2006 has been received and placed of record in the file.

Response to Arguments

Applicant's arguments filed 25 January 2007 have been fully considered but they are not persuasive. The applicant primarily argues the prior art does not teach the "frequency divider providing an output signal at said output side having a quarter of a frequency of an oscillator present at said input side" or in short, the frequency divider is interpreted to be a divide by four circuit. However, Feldman discloses a signal generator comprising frequency dividers applied to selectively reduce the receive and transmit local oscillator signals are of a divide-by-two or divide-by-N division type circuits, N may be an integer or ratio of integers. Feldman points out a JK flip flop configured as a divide-by-two division circuit in figure 2 of the known prior art. Since Feldman teaches a divide-by-N divider circuit, it would have been obvious to combine with Detering that also teaches a transmit frequency generator with a secondary divide-by-N circuit, with other variations to the circuit. Detering further discloses the factor of N supplies a multiple of the number 2, column 2, line 50 to column 3, line 19

The claim objection to claim 8 is resolved with the amendment filed 25 January 2007.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman (US 6,782,249) in view of Detering (US 6,850,121).

As to claim 1, Feldman teaches a circuit configuration for the frequency conversion of an oscillator frequency into a carrier frequency comprising:

A circuit node for receiving a signal having the oscillator frequency (figure 3, a direct conversion transceiver, the output of VCO (308) buffer amplifier (330)),

A mixer having a first input, a second input and an output (figure 3, column 2, lines 29-53, mixer (326), the RF signal output frequency is the sum of the input VCO and the VCO frequency divided by integer N),

A first signal path coupling said circuit node and said first input of said mixer for transmitting the signal with the oscillator frequency unchanged in the signal's frequency (figure 3, a first signal path coupling the buffered VCO frequency to an input to mixer (326)),

A second signal path containing a frequency divider having:

An input side coupled to said circuit node (figure 3, divide by N frequency divider (324) coupled to the output of the VCO buffer amplifier),

An output side coupled to said second input of said mixer (figure 3, column 2, lines 51-67, signal path labeled (328), output of divider (324) coupled to input of mixer (326)), and

Said frequency divider providing an output signal at said output side having *a half of a frequency* of an oscillator signal present at said input side (figure 3, column 2, lines 51-67, divide by an integer, divide by two shown).

Feldman teaches the divide by two division circuits may be replaced with divide by N division circuits, column 2, lines 54-67, but does not indicate N is four such that said frequency divider providing an output signal at said output said having *a quarter of a frequency* of an oscillator signal present at said input side.

Detering teaches a transmit frequency generator comprising a controllable VCO, mixer and divide by N division circuit where the mixer outputs the desired transmit frequency based on the sum of the output signal from the VCO and a the output signal of the VCO divided by N, figure 5, column 2, line 50 to column 3, line 19. Detering further teaches the factor N of the divider supplies a multiple of the number 2 and supplies two output signals which are phase shifted for application in an image reject mixer, figures 5-7, column 3, lines 16-19 and column 5, line 7 to column 6, line 21.

Since Feldman teaches the N of the divide by N division circuits may be a larger integer, column 2, lines 54-67, it would have been obvious to one of ordinary skill in the art at the time of the invention to realize in the divide by N circuit of Feldman value of N that is a multiple of 2 such as 4 as suggested by Detering such that a nonintegral

relationship results between the transmit frequency and the oscillator frequency to provide a good degree of immunity to effects.

As to claim 3 with respect to claim 1, As to claim 1, Feldman teaches a circuit configuration for the frequency conversion of an oscillator frequency into a carrier frequency comprising:

A circuit node for receiving a signal having the oscillator frequency (figure 3, a direct conversion transceiver, the output of VCO (308) buffer amplifier (330)),

A mixer having a first input, a second input and an output (figure 3, column 2, lines 29-53, mixer (326), the RF signal output frequency is the sum of the input VCO and the VCO frequency divided by integer N),

A first signal path coupling said circuit node and said first input of said mixer for transmitting the signal with the oscillator frequency unchanged in the signal's frequency (figure 3, a first signal path coupling the buffered VCO frequency to an input to mixer (326)),

A second signal path containing a frequency divider having:

An input side coupled to said circuit node (figure 3, divide by N frequency divider (324) coupled to the output of the VCO buffer amplifier),

An output side coupled to said second input of said mixer (figure 3, column 2, lines 51-67, signal path labeled (328), output of divider (324) coupled to input of mixer (326)), and

Said frequency divider providing an output signal at said output side having *a half of a frequency* of an oscillator signal present at said input side (figure 3, column 2, lines 51-67, divide by an integer, divide by two shown).

Feldman teaches the divide by two division circuits may be replaced with divide by N division circuits, column 2, lines 54-67, but does not indicate N is four such that said frequency divider providing an output signal at said output said having *a quarter of a frequency* of an oscillator signal present at said input side.

Detering teaches a transmit frequency generator comprising a controllable VCO, mixer and divide by N division circuit where the mixer outputs the desired transmit frequency based on the sum of the output signal from the VCO and a the output signal of the VCO divided by N, figure 5, column 2, line 50 to column 3, line 19. Detering further teaches the factor N of the divider supplies a multiple of the number 2 and supplies two output signals which are phase shifted for application in an image reject mixer, figures 5-7, column 3, lines 16-19 and column 5, line 7 to column 6, line 21.

Since Feldman teaches the N of the divide by N division circuits may be a larger integer, column 2, lines 54-67, it would have been obvious to one of ordinary skill in the art at the time of the invention to realize in the divide by N circuit of Feldman value of N that is a multiple of 2 such as 4 as suggested by Detering such that a nonintegral relationship results between the transmit frequency and the oscillator frequency to provide a good degree of immunity to effects.

Feldman does not teach said second signal path containing a low-pass filter. Detering teaches the transmit frequency generator wherein a second signal path

containing a frequency divider (19) may include a filter element, not illustrated, downstream of the divider, figures 5 and 8, column 5, lines 49-56.

It would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the frequency divider circuit of Feldman to include a filter at the output of the divider circuit of Detering for suppressing the harmonics of the divided signal.

As to claim 4 with respect to claim 1, Detering of Feldman modified teaches the second signal path contains a low-pass filter disposed downstream of said frequency divider in a signal flow direction (figures 5 and 6 a filter not shown, column 5, lines 49-56, a (low pass) filter element for suppressing harmonics of the divided signal used downstream of the divider (19)).

As to claim 7 with respect to claim 1, Detering of Feldman modified teaches the circuit configuration according to claim 1 further comprising an amplifier connected to said output of said mixer (figure 5, amplifier (4), a PA expected in the transmit circuits of a TDMA transceiver).

As to claim 8, Feldman teaches the circuit configuration according to claim 1 further comprising an amplifier including inherent filter properties connected to said output of said mixer for rejecting a higher beat frequency obtained by addition of frequencies of respective signals present at said first and second inputs of said mixer

(figure 3, column 1, lines 5-54 and column 2, lines 51-53, the transmit circuit at the output frequency includes filter (328) where the filter would be inherently active with gain or followed by an amplifier with a design bandwidth such that the transmit carrier is of sufficient power expected in radio frequency communication circuits).

As to claim 9, Feldman teaches the circuit configuration according to claim 1 further comprising an oscillator coupled to said circuit node and providing the oscillator frequency (figure 3, column 1, 1-41, VCO (308) and buffer (330) coupled to integrated direct conversion radio transceiver).

Claims 2, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feldman (US 6,782,249) and Detering (US 6,850,121) further in view of Strange (US 6,574,462).

As to claim 2, Feldman teaches the circuit configuration according to claim 1, wherein said frequency divider is formed as a flip-flop to provide a signal with half a frequency of a signal present at the input, figure 2, column 1, lines 55-65, but does not clearly teach a frequency divide is two frequency dividers formed as two flip-flops disposed one behind another.

Strange teaches a local oscillator apparatus for a direct conversion receiver comprising a mixer coupled to an oscillator input signal and to a second feedback signal such that a local oscillator signal may be produced by a fractional multiplication of the oscillator input signal, the VCO does not have a harmonic relationship with the desired

output frequency to avoid interference, column 1, line 23 to column 2, line 50. Strange discloses the feedback path includes a divide by four functions provided by two successive divide by two dividers, figure 4, column 4, lines 28-45.

It would have been obvious to one of ordinary skill in the art at the time of the invention to realize the single flip-flop in the divide by two frequency division circuit of Feldman modified as the successive divide by two dividers of Strange to achieve a selected divide by four function that supports an oscillator frequency that is not a harmonic relationship of the desired output signal.

As to claim 5 with respect to claim 2, Detering of Feldman modified teaches the second signal path contains a low-pass filter (figures 5 and 6, column 5, lines 49-56, a (low pass) filter element for suppressing harmonics of the divided signal used downstream of the divider (19) (not shown)).

As to claim 6 with respect to claim 2, Detering of Feldman modified teaches the second signal path contains a low-pass filter disposed downstream of said frequency divider in a signal flow direction (figures 5 and 6, column 5, lines 49-56, a filter element for suppressing harmonics, which would typically be a low pass type, of the divided signal used downstream of the divider (19) (not shown)).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J. Jackson whose telephone number is (571) 272-7890. The examiner can normally be reached on Monday through Friday, 9:00 AM-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BJJ

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